UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
SUPERFUND PROGRAM

PROPOSED PLAN FOR REMEDIAL ACTION (OU1)

BRUNSWICK WOOD PRESERVING SITE
Brunswick, Glynn County, Georgia ***July, 2001***

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) is issuing this Proposed Plan for the Brunswick Wood Preserving Superfund Site, to provide public notice of the Preferred Alternative for Operable Unit One (OU1), and to provide for public comment on the proposed cleanup action. In addition to providing a rationale for the Preferred Alternative, this Proposed Plan will summarize the other cleanup alternatives that were evaluated for purposes of OU1. OU1 addresses site-wide soils and groundwater at the site. The proposed remedy is ***Capping with Construction of Subsurface Barriers.*** This document is issued by the EPA, the lead agency for site cleanup activities, and the Georgia Environmental Protection Division (GEPD), the support agency. EPA, in consultation with the GEPD, will select a remedy for OU1 after public comments have been considered. A glossary of key terms used in this document is shown at the end of this document.

EPA issues this Proposed Plan as part of its public participation responsibilities under Section 300.430 (f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation/ Feasibility Study (RI/FS) and other documents contained in the Administration Record for this site. EPA and the State encourage the public to review these documents to gain a more comprehensive understanding of the Site.

MARK YOUR CALENDAR!

Public Comment Period
Dates: July 16, 2001 through August 14, 2001

Public Meeting
Date: July 26, 2001
Time: 6:30 p.m.
Place: Stellar Conference Center
Magnolia Rooms A, B
144 Venture Drive
(next to Quality Inn)

EPA Contacts:

Provide comments by close of the comment period to:

Brian Farrier
Project Manager
Email:
farrier.brian@epa.gov
Fax: 1-404-562-8955
or
Angela Leach
Email:
leach.angela@epa.gov
Community Relations
Phone: 1-800-435-9234

The Administrative Record for the site can be found at the local Information Repository for the Site, located at:

Brunswick- Glynn Library
3208 Gloucester St.
Brunswick, Georgia 31520

SITE DESCRIPTION

The Brunswick Wood Preserving Superfund site is located in north Glynn County, Georgia, north of the city of Brunswick. The site is located on Perry Lane Road approximately 0.5 miles east of the intersection of Perry Lane and Highway 341, New Jesup Highway (see Figure 2 on the next page). The site moved to its present location around 1958.

The site is 84 acres in size, with railroads located on its east and west ends. The north end is defined by Perry Lane Road, whereas the south end is defined by residential properties and wooded areas. Burnett Creek, a tidally influenced stream, is located to the west of the site. Most, if not all, of the site drainage flows into Burnett Creek. A site map is included here as Figure 2.

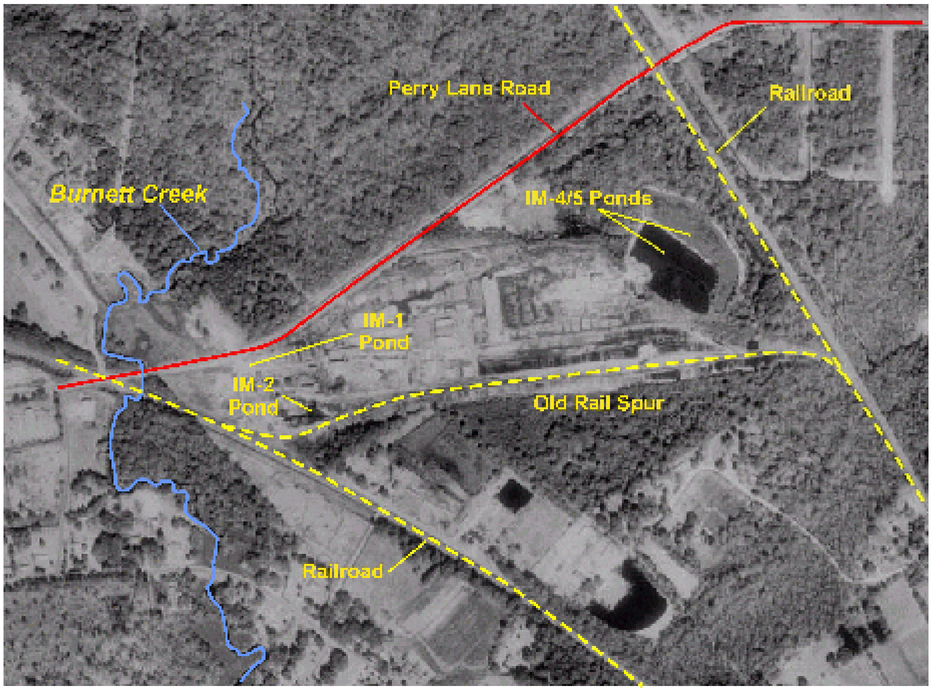
The site was originally operated by American Creosote Company, who constructed the facility sometime between 1958 and 1960. The site was acquired by Escambia Treating Company in 1969 from Georgia Creosoting Company and the Brunswick Creosoting Company, thought to be the same company. In 1985, a corporate reorganization resulted in the purchase of the facility by the Brunswick Wood Preserving Company, who operated the site until it closed in early 1991.

Each of the three major wood treating operations were carried out at the facility: cresosote, PCP (pentachlorophenol), and CCA (chromium/ copper/arsenic). Figure 2 shows the old creosote ponds that were formerly used at the site. IM-1 and IM-2 are located to the west, while IM-4 and IM-5 are located to the east.

The site was listed on EPA's National Priorities List (NPL) on April 1, 1997.

SCOPE AND ROLE OF OPERABLE UNITS

EPA will conduct cleanup activities in separate parts, or operable units (OUs). Operable Unit One (OU1) will primarily address site-wide soils and groundwater to protect human health. Operable Unit Two (OU2) will primarily address ecological risks posed to Burnett Creek. It is important to note that the Baseline Risk Assessment for Human Health (BRA-HH) has been completed but the Baseline Ecological Risk Assessment (BERA) has not been completed. For this reason, OU1 and OU2 are not strictly media specific (i.e., groundwater, soil, surface water). For example, it is proposed here that OU1 address a portion of the Burnett Creek sediments between Perry Lane Road and Old Jesup Road, based on available information. It is possible that these sediments represent an unacceptable ecological risk. Since those sediments can be addressed within the scope of the OU1 remedy, there is little advantage to waiting until the BERA is complete.



NOT TO SCALE

FIGURE 2
SITE MAP
BRUNSWICK WOOD PRESERVING
BRUNSWICK, GEORGIA

PREVIOUS CLEANUP ACTIONS

Several spills have been documented at this site during its operational history. The last occurred in August 1989, causing a major fish kill in Burnett Creek.

EPA REMOVAL ACTION (1991-95)

In March of 1991, EPA began a four year removal action after a fire occurred at the site, shortly after operations had ceased. Many actions were taken during this time: site structures were demolished and removed; sludges were dewatered; wastewater was treated; drums and lab wastes were disposed off-site; poles, lumber, equipment, and scrap metal were recycled and/or salvaged; and large areas of contaminated soil were excavated. Soils were excavated from under the old rail spur which ran along the southern boundary of the facility, the creosote/penta treatment area at IM-2, the CCA treatment area, treated pole storage areas, and the IM-1 impoundment area. These excavated soils were placed on-site in four different encapsulated waste cells, each covered by a geomembrane. In addition, almost fifty private drinking water wells were sampled during this time. The EPA removal action cost approximately 11.9 million dollars (using current cost rates).

STATE REMOVAL ACTION (1996-97)

In 1996, the State of Georgia's Environmental Protection Division (GEPD) began a separate removal action. This action involved the off-site transportation and disposal of 3 of the 4 waste cells that remained on-site after EPA's removal action. During the State's removal action, a total of 151,000 tons of contaminated material was disposed off-site. The State removal action cost approximately 18 million dollars.

The waste cell remaining on-site contains contaminated soils from the CCA (copper-chromium-arsenate) treatment area and is not shown on Figure 2. It is located just west of IM-4/5.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) HIGHLIGHTS

A brief summary of EPA's sampling activities is given below. The reader is encouraged to review the Administrative Record (AR) for more information on these activities.

December, 1996: Soil and residential well water samples were collected on Floraville Road and on Eulalee Street. No levels of public health concern were found in these samples (see "Brunswick Community Based Environmental Protection Study, December 1996").

February, October 1997: Phase I of the RI included soil, ground water, surface water, sediment, and forage fish tissue sampling. Additional groundwater sampling was done during Phase II, in addition to soil sampling where the three waste cells had been located. Extensive contamination was documented in the old creosote impoundments designated IM-1, IM-2, and IM-4/5 (see Figure 2). See "Remedial Investigation Report, Brunswick Wood Preserving Superfund Site, June 1998".

February, 1999: Supplemental work was conducted after EPA's community interviews, to investigate a potential off-site drainage pathway. No levels of public health concern were found in these samples (see "Supplemental Sampling Investigation Report, February 1999").

May, 2000: RI - Phase III included installation of 34 permanent monitoring wells, in addition to sampling of temporary wells, residential wells, Burnett Creek sediments, residential soils, and on-site soils (see "Final Report - Phase III Remedial Investigation", December, 2000). It was found that groundwater contamination from the IM-1 pond had extended to the weathered limestone layer located at about 50 feet deep.

November, 2000: Additional drilling work was done to investigate the subsurface geology at the site (see "Technical Memorandum - Barrier Wall Feasibility", February, 2001). It was confirmed that contamination at the IM-2 pond was pooling on top of a thin clay layer located at about 15 feet deep. However, analytical data did reveal contamination beneath the thin clay. At the IM-4/5 ponds, it was found that the thicker clay layers at about 40' deep are probably preventing much of the contamination from reaching the weathered limestone layer. However, these clay layers are not continuous - in one location no clay was found. Consistent with previous data, no evidence was found that groundwater contamination extends beyond the weathered limestone layer at ~50-65 feet deep (no residential wells in the area have been impacted). Very low contaminant levels (7 ppb total) found in groundwater west of Burnett Creek are not thought to be representative - previous data shows no groundwater impact west of Burnett Creek. It was also found that pooling (heavier than water) contamination under the IM-4/5 pond does not appear to be migrating beyond the pond boundaries below the ground surface (previous data does show dissolved contaminants migrating away outside the pond boundaries). Subsurface soil samples were taken within the ponds to calculate volumes of contaminated soil, and geotechnical parameters were obtained on rock cores taken from the weathered limestone. Biota and sediment sampling was also conducted in Burnett Creek at this time. Results are documented in the "Supplemental Sampling Investigation Report, Subsurface Site Soils, Groundwater, and Burnett Creek, May 7, 2001".

The following documents can also be found in the AR:

June, 1999: "Final Baseline Risk Assessment for Human Health".

October, 1999: "Final Feasibility Study Report for OU1". This report was done *before* expanding the scope of OU1.

***June, 2001*:** "Final Feasibility Study Report for OU1". This report was done *after* expanding the scope of OU1 to address site soils and groundwater.

CONTAMINANTS OF CONCERN

There are four major contaminants, or groups of contaminants, that pose potential risk to human health and the environment at this site. Results from EPA's RI activities are discussed below:

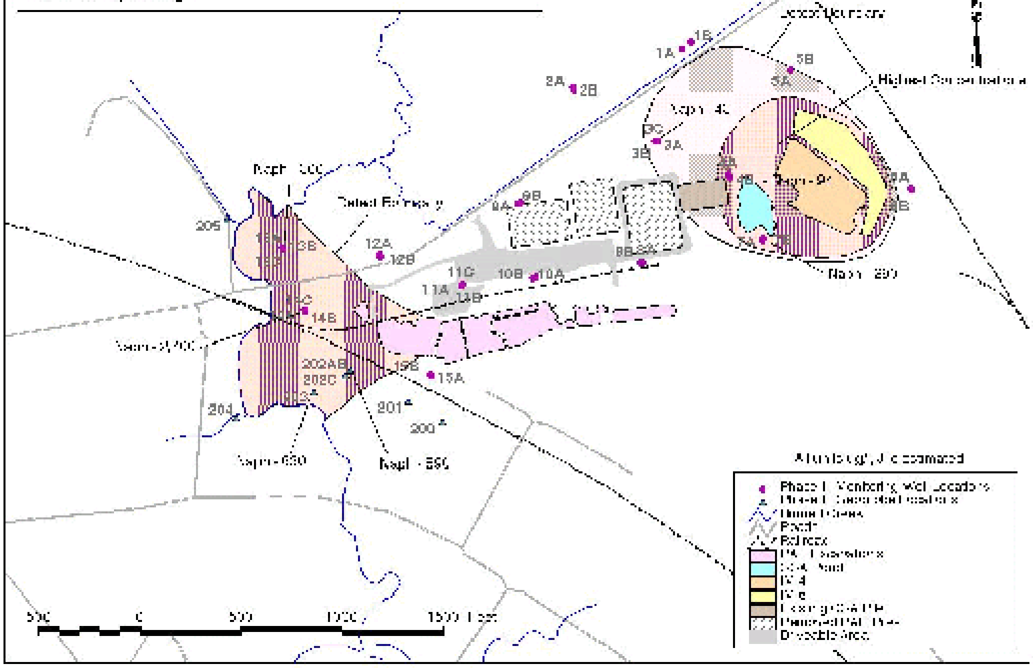
***Pentachlorophenol (PCP)*:** Pentachlorophenol (PCP) was found at maximum levels of 3000 ppm in the pond sediments (at IM-4/5) and 23 ppm in site surface soils outside the ponds.

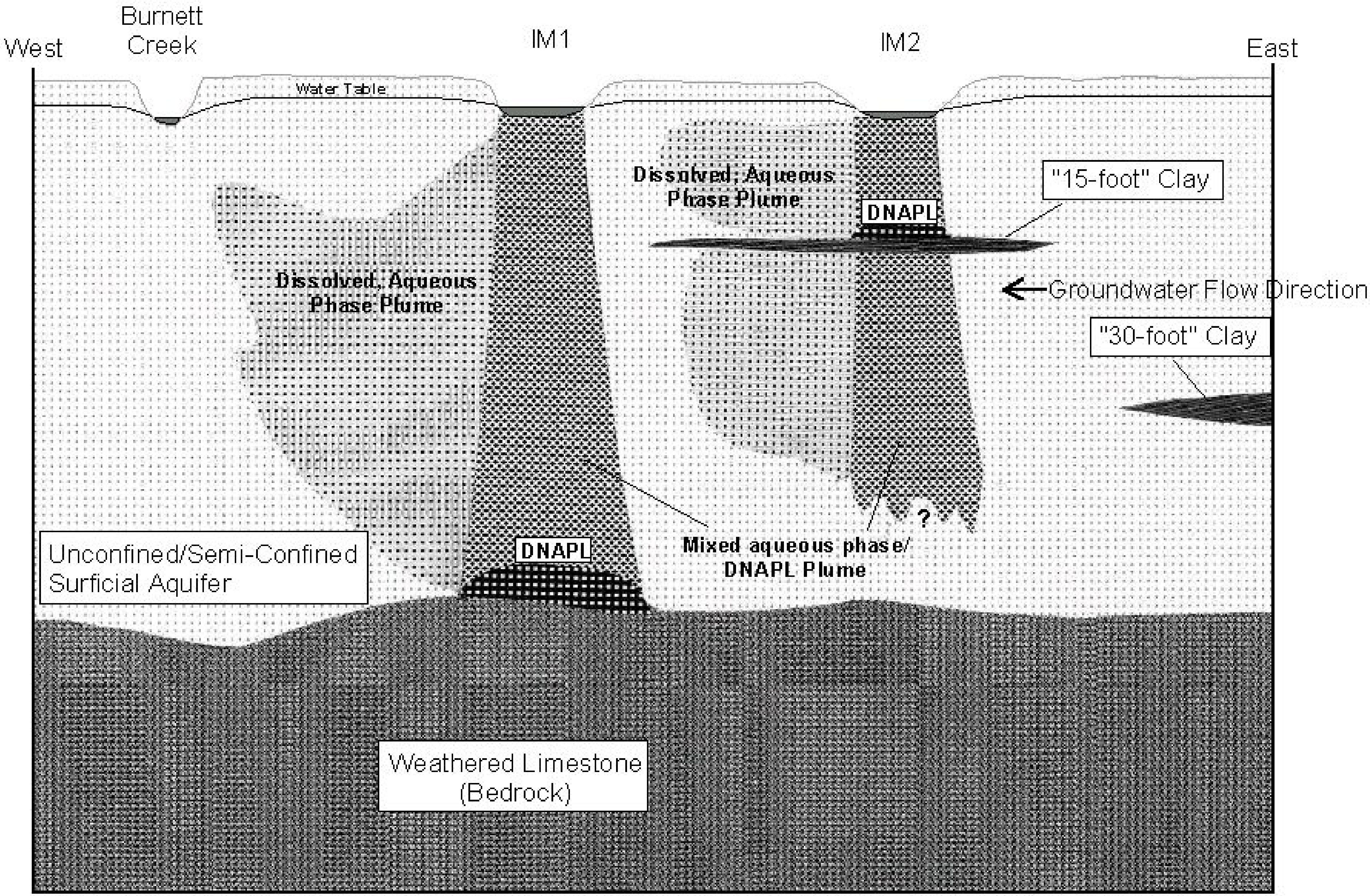
Dioxin: Dioxins are a group of compounds representing an unwanted but unavoidable by-product of the manufacture of PCP. It occurs at very small levels and is more toxic than the other site contaminants, but does not tend to migrate through soil. Dioxin was found at maximum levels of 12 parts per billion (ppb) TEQ in the pond sediments (IM-4/5) and 13 ppb TEQ in site surface soils. These results are expressed as toxic equivalents (TEQ) to 2,3,7,8-TCDD which is the most toxic of dioxin's many congeners. Dioxin was also found at a maximum of 0.54 ppb in the sediments of Burnett Creek.

PAHs: Polycyclic aromatic hydrocarbons (PAHs) are a group of compounds associated with the creosote used at this site. PAHs were found at maximum levels of 100 ppm BAPE in the pond sediments (IM-4/5) and 1 ppm in site surface soils. These results are expressed as toxic equivalents to benzo(a)pyrene (BAPE) which is the most toxic PAH. Figure 4-6 shows the PAH napthalene in groundwater beneath the site. No groundwater contamination above drinking water standards has moved west underneath Burnett Creek, nor crossed underneath Perry Lane Road from IM-4/5 (see conceptual site models on next page.

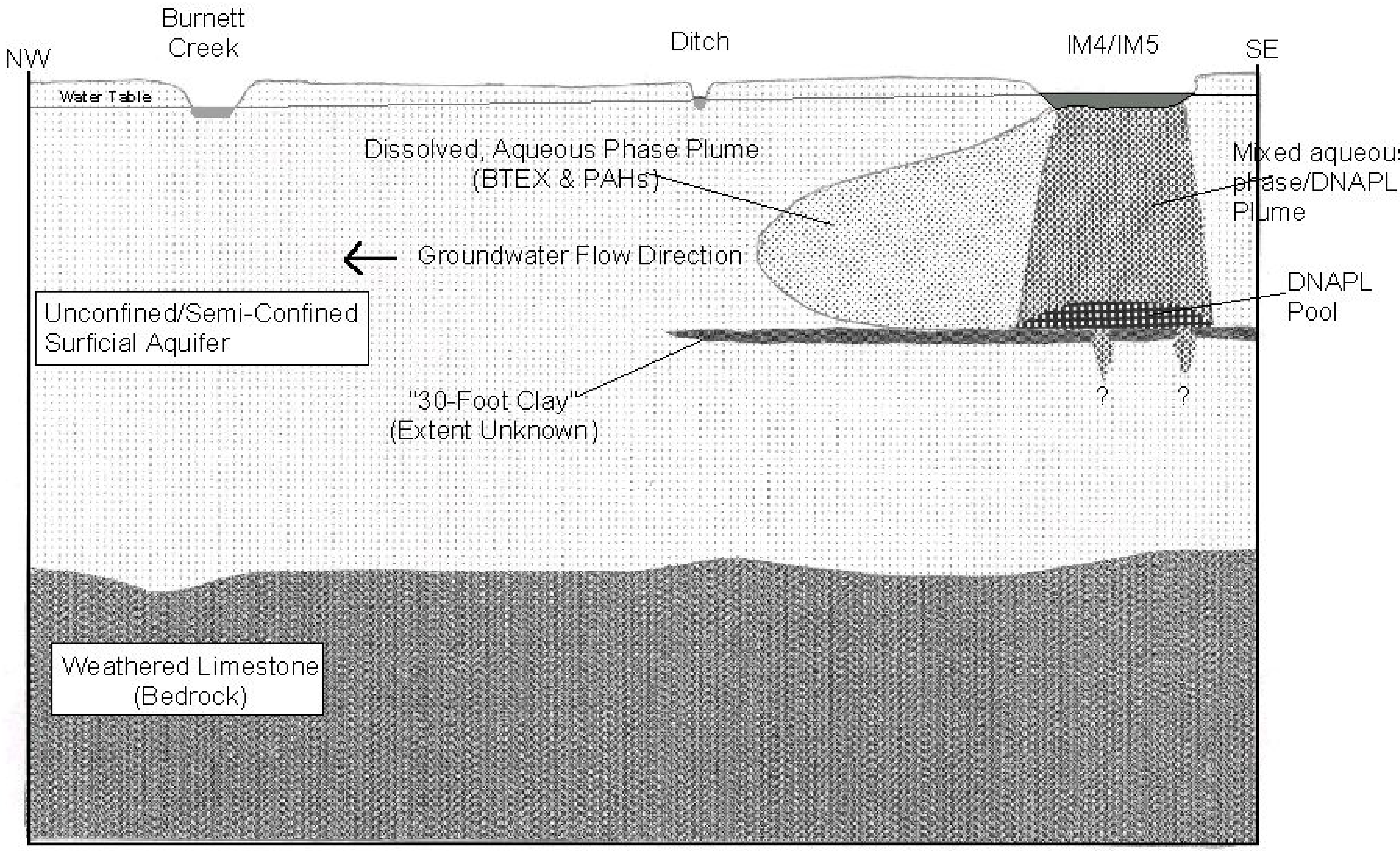
Arsenic: Arsenic was associated with the CCA process at this site, and was found at maximum levels of 97 ppm in the pond sediments (IM-4/5) and 94 ppm in site surface soils. The CCA facility was excavated during EPA's removal action and that excavated material remains on-site in the CCA Waste Cell.

Figure 4-6
Intermediate PAH Plumes, Highlighting Naphthalene
Brunswick Wood Superfund Site
Brunswick, Georgia





Conceptual Model for Contaminant Behavior and Migration, IM1/IM2 Area
Brunswick Wood Superfund Site



Conceptual Model for Contaminant Behavior and Migration, IM4/IM5 Area
Brunswick Wood Superfund Site

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA has conducted a baseline risk assessment to determine the current and future effects of the site contaminants on human health. This document is available for review as part of the AR (see "Final Baseline Risk Assessment for Human Health, June, 1999). According to Glynn County, the site is currently zoned for commercial land use. This is also the reasonably anticipated future land use. The shallow aquifer is not used in the area for drinking water, but is a potential future drinking water source for the community once safe cleanup levels have been achieved. The baseline risk assessment calculated health effects for both children and adults, in both residential and commercial land uses, that could result from current and future direct contact with site soils and groundwater. It is EPA's current judgement that the Preferred Alternative identified in this Proposed Plan, or perhaps one of the other active measures considered in the Proposed Plan, is necessary to protect public health or the environment from actual or threatened releases of hazardous substances into the environment.

The excess cancer risk levels due to site surface soils are 4 x 10-3 for the lifetime resident, and 7 x 10-4 for the future on-site worker. What these values mean statistically is that for every 1000 *residents* exposed to site surface soils over a seventy year lifetime, 4 extra cancers *may* result beyond those expected from all other causes. For every 10,000 site *workers*, 7 extra cancers *may* result from a 25 year career working on-site. These risk estimates are based on current reasonable maximum exposure scenarios, using conservative assumptions about the frequency and duration of an individual's exposure, in addition to toxicity data.

REMEDIAL ACTION OBJECTIVES (RAOs)

The Remedial Action Objectives (RAOs) for Operable Unit One (OU1) at this site are to:

- prevent human ingestion, inhalation, or direct contact with surface soils that exceed the performance standards;
- control migration and leaching of contaminants in surface and subsurface soil to groundwater that could result in groundwater contamination in excess of drinking water standards or health-based levels;
- prevent ingestion or inhalation of any soil particulates in air, that exceed the performance standards;
- control future releases of contaminants to ensure protection of human health;
- permanently and/or significantly reduce the mobility of site contaminants; prevent ingestion of groundwater having concentrations in excess of performance standards;
- restore the groundwater aquifer to drinking water standards and health-based levels;
- prevent discharge of groundwater contaminants to surface water that would exceed surface water quality standards.

This proposed remedial action will reduce the excess cancer risk associated with a site worker's exposure to site soils to a maximum of 3 in 100,000. This will be achieved by reducing the concentration of dioxin in site soils to a target level of 1 ppb TEQ or less. However, actual site risks will be lower depending on the exact quantity of material needed for the subcap (see the discussion for Alternative S2).

SUMMARY OF REMEDIAL ALTERNATIVES

Remedial alternatives for Operable Unit One of the Brunswick Wood Preserving site are given below, for both soils/sediments and groundwater. A short description is provided, along with a total present worth cost and implementation time, in years. See Sections 4 and 5 of the Feasibility Study for OU1, for a complete discussion of each alternative.

SOILS/SEDIMENTS

EPA evaluated five alternatives for remediating contaminated soils and sediments. Alternatives S4 and S5 would excavate and treat the contaminated material in the old creosote ponds. The volume of material in these ponds that would require treatment is estimated to be 1,077,000 cubic yards.

S1 - No Action

Est. Capital Cost: $0
Est. Annual O&M Cost: $10,200
Est. Present Worth Cost: $117,000
Est. Implementation Time: <1 year

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) requires that a No Action alternative be evaluated as part of the screening process, in order to provide a baseline for comparison to other alternatives. Under this alternative, no further remedial action would be taken at the Brunswick Wood Preserving site. The present worth costs shown would be based on maintenance and future sampling to monitor the soils and groundwater at the site. Institutional controls would be put in place to restrict the future land use as necessary.

S2 - Capping with Construction of Subsurface Barriers

Est. Capital Cost: $16,274,280
Est. Annual O&M Cost: $225,875
Est. Present Worth Cost: $26,197,170
Est. Implementation Time: <1 year

This alternative involves the construction of caps over the IM-1/2 ponds to the west, and the IM-4/5 pond to the east. Caps will prevent both future leaching to groundwater/surface water and direct contact. The slurry walls can be located beyond the pond boundaries to capture part of the groundwater contaminant plume. Subcaps 3 to 5 feet thick would be constructed consisting of excavated material from other portions of the site. At a minimum, the subcap would incorporate the CCA Waste Cell, soils known to contain dioxin above the performance standard of 1 ppb TEQ, and sediments excavated to approximately 1 foot deep from two areas of Burnett Creek. The first area would be at Perry Lane Road where the IM-1 pond still discharges to the creek. The second would be the short east-west portion of the creek just south of Perry Lane Road, a depositional area containing the maximum dioxin levels in creek sediments. Although not a human health threat, the relatively small volume of creek sediments involved could easily be incorporated as part of the S2 Alternative. However, the subcap may require even more material, possibly addressing addressing other areas of the site. The subcap materials would be treated with solidification/ stabilization (S/S, see discussion under Alternative S3) to immobilize contaminants and provide a stronger base for the cap. A geosynthetic liner and a 2.5 foot thick soil layer is then placed over the subcap.

This alternative also includes subsurface barrier walls that would halt subsurface horizontal movement of contaminants. These barrier walls consist of slurry-filled trenches that would be dug to the weathered limestone at 50 to 65 feet deep. This weathered limestone would serve as the “floor” to prevent downward migration of contaminants. Surface drainage controls would be constructed around the perimeter of the cap to control surface water runoff, and other engineering controls would be used to ensure that RAOs are met during and after implementation of this alternative. Institutional controls would be put in place to restrict the future land use as necessary. Long-term monitoring would be required to ensure the caps and slurry walls maintain their integrity, and a pump-and-treat groundwater system would be necessary if the weathered limestone were shown to be leaky in the future. This monitoring would also include sampling of subsurface soils under the cap to determine if natural attenuation of contaminants is occurring in-situ.

S3 - In-Situ Treatment with Steam Stripping, On-Site Treatment with Solidification/Stabilization & On-site Disposal

Est. Capital Cost: $93,107,500
Est. Annual O&M Cost: $1,201,000
Est. Present Worth Cost: $156,348,657
Est. Implementation Time: 5 years

For this alternative, contaminated materials would be treated in two steps. First, in-situ treatment with dynamic underground stripping (DUS) would be performed on the organic contaminants in the IM-1/2 and IM-4/5 pond materials. DUS involves electrical heating of subsurface soil, steam injection, and vacuum extraction of contaminants. The second step would be treating the inorganic materials in the CCA Waste Cell with solidification/ stabilization (S/S), with on-site placement afterward. S/S treatment technologies are used to physically bind (solidification) or chemically immobilize (stabilization) contaminants to reduce their mobility. S/S technologies include cement, lime, pozzolan, or silicate-based additives or chemical reagents. Engineering controls would be used to ensure that RAOs are met during and after implementation of this alternative. Institutional controls would be put in place to restrict the future land use as necessary.

S4 - Excavation, On-Site Treatment with Solid-Phase Bioremediation & Solidification/ Stabilization, and On-Site Disposal

Est. Capital Cost: $117,820,000
Est. Annual O&M Cost: $247,500
Est. Present Worth Cost: $193,276,618
Est. Implementation Time: 10 years

This alternative also consists of two separate treatment steps, similar to Alternative 3. Organic contaminants excavated from the IM-1/2 and IM-4/5 ponds would be transported to a central area on-site and treated with solid phase bioremediation. Bioremediation technologies encourage the growth of microorganisms with the addition of soil conditioners, mineral fertilizers, oxygen, and moisture. The microorganisms then biodegrade the contaminants to less toxic (or non-toxic) forms. The second step would be identical to that described for Alternative 3, whereby the inorganic contaminants in the CCA Waste Cell are treated with S/S technologies. All materials from both steps would be placed on-site after treatment is completed. Engineering controls would be used to ensure that RAOs are met during and after implementation of this alternative. Institutional controls would be put in place to restrict the future land use as necessary.

S5 - Excavation, On-Site Treatment with Thermal Desorption/BCD, Solidification/ Stabilization & On-Site Disposal

Est. Capital Cost: $252,445,000
Est. Annual O&M Cost: $247,500
Est. Present Worth Cost: $411,362,557
Est. Implementation Time: 5 years

This alternative also consists of two separate treatment steps, similar to Alternative 3 and 4. Organic contaminants excavated from the IM-1/2 and IM-4/5 ponds would be transported to a central area on-site and treated with thermal desorption technology. Preprocessing may be required to remove water and solid materials.

Thermal desorption uses a medium temperature thermal desorber operating at temperatures of 600 to 950 degrees Fahrenheit to thermally desorb contaminants from soil, then remove them from the off-gas. Base catalyzed decomposition (BCD) would be used for chemical dehalogenation. The second part of this alternative would be identical to that described for Alternative 3, whereby the inorganic contaminants in the CCA Waste Cell are treated with S/S technologies. All materials from both steps would be placed on-site after treatment is completed. Engineering controls would be used to ensure that RAOs are met during and after implementation of this alternative. Institutional controls would be put in place to restrict the future land use as necessary.

GROUNDWATER

For groundwater, three alternatives were evaluated in the Feasibility Study.

G1 - No Action

Est. Capital Cost: $0
Est. Annual O&M Cost: $11,200
Est. Present Worth Cost: $129,428
Est. Implementation Time: <1 year

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) requires that a No Action alternative be evaluated as part of the screening process, in order to provide a baseline for comparison to other alternatives. Under this alternative, no further actions would be taken to address the groundwater under the site. Costs shown are for future monitoring of the groundwater.

G2 - Capping with Construction of Subsurface Barriers

Est. Capital Cost: $620,000
Est. Annual O&M Cost: $473,000
Est. Present Worth Cost: $2,392,426
Est. Implementation Time: 2 years

This alternative would be put in place with Alternative S2 as described above for soils/sediments. Costs shown here are for two remedy components not included with Alternative S2. First, an in-situ groundwater treatment system would be used to address groundwater contamination outside the cap and wall at IM-1/2, where railroad tracks and Perry Lane Road are potential obstacles. This groundwater treatment would consist of chemical oxidation to enhance natural degradation of contaminants. As shown on Figures 4-6 and on the site conceptual models, contamination is not crossing under Burnett Creek. Second, monitoring of the groundwater would be required after the barrier walls and caps are in place. Institutional controls would be put in place to restrict the future land use as necessary.

G3 - In-Situ Treatment with Biological, Chemical and/or Physical Treatment

Est. Capital Cost: $826,500
Est. Annual O&M Cost: $841,138
Est. Present Worth Cost: $9,845,421
Est. Implementation Time: 30 years

Alternative G3 would consist of an in-situ system that treats the groundwater below the ground.   This can be done by constructing a series of injection wells to create treatment zones. Treatment walls can also be built across the path of contaminated plume of groundwater. As contaminated groundwater flows through these zones and or walls, the contaminants are removed or treated by physical, chemical, and/or biological processes. In-situ treatment can offer lower energy costs without the need to bring groundwater to the surface. There is also less technical and regulatory considerations since there is no effluent discharge. More site characterization would be needed to effectively design an in-situ groundwater treatment system. Engineering controls would be used to ensure that RAOs are met during and after implementation of this alternative. Institutional controls would be put in place to restrict the future land use as necessary.

Why Isn't There An Alternative to Excavate These Ponds and Dispose of the Materials Off-Site Like the State of Georgia Did?

Effective May 12, 1999 wood treating wastes had to meet new treatment standards before being land disposed at a permitted hazardous waste landfill. This means that excavated pond materials from the Brunswick Wood Preserving site would now have to be treated before being taken off-site. The Feasibility Study did include this alternative, but screened it out since off-site disposal would not be necessary if treatment is required. Alternatives S4 and S5 are shown with on-site disposal of the treated material after it is treated with either bioremediation (S4) or thermal desorption (S5).

TABLE I: CRITERIA FOR EVALUATING CLEANUP ALTERNATIVES
<u>1. Overall Protection of Human Health and the Environment</u> -- Assesses degree to which alternative eliminates, reduces, or controls health and environmental threats through treatment, engineering methods, or institutional controls.
<u>2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)</u> -- Assesses compliance with Federal/State requirements.
<u>3. Implementability</u> -- Refers to the technical feasibility and administrative ease of a remedy.
<u>4. Short-Term Effectiveness</u> -- Length of time for remedy to achieve protection and potential impact of construction and implementation of the remedy.
<u>5. Long-Term Effectiveness and Permanence</u> -- Degree to which a remedy can achieve and maintain protection of human health and environment once cleanup goals have been met.
<u>6. Reduction of Toxicity, Mobility, or Volume By Treatment</u> -- Expected outcome of the treatment methods on the harmful nature, movement, or amount of contamination.
<u>7. Cost</u> -- Weighs the benefits of a remedy against its cost.
<u>8. State Acceptance</u> -- Consideration of State's opinion of the preferred alternatives. This assessment is generally not completed until comments on the proposed plan are received.
<u>9. Community Acceptance</u> -- Consideration of public comments on the Proposed Plan. This assessment is generally not completed until comments on the proposed plan are received.

COMPARISON OF REMEDIAL ALTERNATIVES

This section provides the basis for determining which alternative best meets the nine criteria set forth in the National Contingency Plan (NCP). The threshold criteria (numbers 1-2 on Table 1) must be met for an alternative to be considered. Please note that the Baseline Ecological Risk Assessment (BERA) has not been completed and that environmental risk will be addressed as part of Operable Unit Two (OU2). Primary balancing criteria (numbers 3-7 on Table 1) are factors used to weigh major trade-offs among the alternatives. Modifying criteria (numbers 8-9 on Table 1) are **State Acceptance** and **Community Acceptance.** The purpose of this Proposed Plan is to seek input from the public on the appropriateness of the Preferred Alternative. EPA will select a final remedy only after careful consideration of all comments received. EPA will tell the public how it responded to comments in the Responsiveness Summary included in the Record of Decision (ROD), the document explaining EPA's remedy selection. That document will be made available to the public. EPA has consulted the Georgia Environmental Protection Division (GEPD) and will seek its concurrence with the proposed actions for OU1. The public is encouraged to comment on all the alternatives presented in this Proposed Plan. The threshold and balancing criteria for the on-site soils/sediments and groundwater alternatives are considered separately here.

OVERALL PROTECTION OF HUMAN HEALTH AND ENVIRONMENT

All the alternatives except the “no action” alternatives (S1 and G1) would provide adequate protection of human health by eliminating, reducing, or controlling risk through treatment, engineering controls, and/or institutional controls. (ecological risk will be addressed as part of OU2). Because Alternatives S1 and G1 are not protective of human health, they will not be discussed further for the remaining criteria.

Chemicals of concern in soils could be treated to risk-based levels by Alternatives S3, S4, and S5, whereas Alternative S2 would provide protection by preventing direct contact exposure to contaminated soils and preventing leakage of the source materials in the ponds to deeper groundwater. Institutional controls to restrict land use as necessary would further protect human health.

Alternative G3 would use treatment to eliminate human risk via groundwater exposure, whereas Alternative G2 would do so by capturing the majority of the contaminated groundwater and immobilizing it with a slurry wall.

COMPLIANCE WITH ARARS

All soil and groundwater alternatives would meet their respective ARARs from Federal and State laws.

IMPLEMENTABILITY

All soil alternatives are readily available and are generally proven technologies. However, the treatment technologies (Alternatives S3, S4, and S5) will require more effort during Remedial Design for site-specific treatability studies before cleanup could begin. Alternative G3 also requires additional site characterization to design an in-situ groundwater treatment.

SHORT-TERM EFFECTIVENESS

Alternatives S4 and S5 involve excavation of contaminated soils and sediments from the old creosote ponds and therefore represent a potential for short-term exposure to site workers. Of the soil alternatives, S2 would result in the least potential for short-term exposure to site workers. Likewise, Alternative G2 would result in less potential short-term exposure than Alternative G3.

LONG-TERM EFFECTIVENESS AND PERMANENCE

The treatment alternatives (S3, S4, S5, and G3) would not require further controls to ensure this criterion is met, provided performance standards are met. However, there is a potential for problems: dioxins are very stable and immobile in the environment and do not lend themselves to breakdown. In addition to more time, there is no assurance that Alternative S4 (bioremediation) would achieve performance standards. Past experience with Alternative S5 (thermal desorption) has shown problems addressing carcinogenic PAHs, which are also relatively stable compounds in the environment. Alternative G3 would present potential problems treating dense non-aqueous phase liquid (DNAPL) compounds. DNAPLs tend to sink in the groundwater table and can thus be hard to capture within treatment walls or zones. Alternatives S2 and G2 will require long-term monitoring to ensure the integrity of the caps and slurry walls, and require careful design of the slurry walls to ensure that creosote does not break down the slurry walls.

REDUCTION OF TOXICITY, MOBILITY OR VOLUME BY TREATMENT

Alternatives S3, S4, S5, and G3 would reduce toxicity by removing or degrading site contaminants from soils and groundwater, although it is not certain that these treatment technologies could reach performance standards without a further need for containment. Alternative S2 and G2 would not achieve a reduction of toxicity or volume by treatment, although a partial reduction of mobility would be achieved for those materials undergoing solidification and/or stabilization for the subcap. Alternative S4 (bioremediation) could result in some increase in volume due to addition of soil amendments, etc.

COST

Alternatives S3, S4, and S5 call for treatment of contaminated soils and sediments, and are much more expensive than Alternative S2 due to the large quantities of contaminated material in the old creosote ponds, estimated at over 1 million cubic yards. Alternative G3 is more expensive than Alternative G2.

PREFERRED ALTERNATIVE

Based on the comparison of alternatives summarized as part of this document, EPA's preferred alternative for Operable Unit One (OU1) is a combination of Alternatives S2 and G2, or ***"Capping with Construction of Subsurface Barriers".*** The estimated cost to implement this remedy will be a total of $26.326 million. The selection of this remedy is based on the best balance of the criteria EPA used to evaluate possible cleanup alternatives, for both site soils/sediments and for groundwater:

- Will achieve protection for human health and comply with ARARs.
- Will partly achieve the statutory preference for treatment, by reducing mobility in the materials used for the subcaps;
- Will eliminate rainfall infiltration and leaching of site contaminants to groundwater and surface water;
- Will provide the most cost-effective alternatives for both site soils/sediments and groundwater;
- Is readily implementable using proven technology;
- Will minimize short-term potential exposures since excavation of the creosote ponds is not required;
- Will provide a long-term effective remedy.

The selected remedy, ***Capping with Construction of Subsurface Barriers***, would include:

- Construction of two caps over the IM-1/2 and IM-4/5 ponds, consisting of subcaps, geosynthetic liners, and a 2.5 foot thick soil layer;
- Construction of 3 to 5 foot thick subcaps under the caps. These caps will consist at a minimum of soils and sediments from three sources: the CCA Waste Cell, site soils above the performance standard of 1 ppb TEQ, and selected sediments from Burnett Creek located at Perry Lane Road and in the short east-west reach of the creek just south of Perry Lane Road.
- Solidification and/or stabilization of the subcap materials;
- Construction of subsurface barrier walls to contain groundwater, consisting of slurry-filled trenches to be dug to the weathered limestone located at 50 to 65 feet deep.
- In-situ groundwater treatment using chemical oxidation to enhance natural degradation of site contaminants in groundwater outside the cap/wall at IM-1/2;
- Long-term monitoring to ensure that the remedy is protective. This monitoring would include: sampling under the caps to see if natural processes break down site contaminants, groundwater sampling outside the slurry walls, and ensuring the slurry walls' integrity.
- Engineering controls to control surface water runoff, dust, air quality, etc. and ensure that Remedial Action Objectives are met during and after putting the remedy in place;
- Institutional controls as necessary to restrict future land use and groundwater use.

GLOSSARY

Administrative Record: Set of documents and data used in selecting cleanup remedies at NPL sites. The record is placed in the information repository to allow public access.

Aquifer: Underground rock formation composed of materials such as sand, soil, or gravel that can store and supply groundwater to wells and springs.

ARARs: Applicable or Relevant and Appropriate Requirements. Refers to Federal and State requirements a selected remedy must attain which vary from site to site.

CERCLA: The Comprehensive Environmental Response, Compensation, and Liability Act, otherwise known as the Superfund Law. This law was passed in 1980 to remediate the nation's worst environmental problems.

Copper, Chromium, Arsenic (CCA): A combination of inorganic compounds that are commonly used to treat wood.

Creosote: A mixture of many chemicals, including PAHs. This once common wood preservative is produced from coal tar, which comes from high temperature treatment of coal.

Dioxins: A class of chemicals, almost always unwanted by-products of manufacture, consisting of chlorinated benzene rings joined by two oxygen molecules. Most toxic dioxin is 2,3,7,8-TCDD.

Drinking Water Standard : Maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

Groundwater: Water found beneath the earth's surface that fills pores between materials such as sand, soil, or gravel.

Information Repository: File set up near Superfund sites for the public which contain information and reference documents relevant to EPA activities.

National Priorities List (NPL): EPA's list of priority hazardous waste sites that are eligible to receive federal money for response under Superfund.

Operation and Maintenance (O&M): Activities conducted at NPL sites after cleanup remedies have been constructed to ensure that the remedy is still properly functioning.

Part Per Million, Parts Per Billion (ppm, ppb): Units commonly used to express the concentrations of contaminants. For example, a check written for one penny on a $10,000,000 bank account is analogous to one part ber billion.

Pentachlorophenol (PCP): A once common wood preservative, now banned, consisting of five chlorine atoms on a benzene ring.

Polycyclic Aromatic Hydrocarbons (PAHs): A class of compounds, common in creosote, consisting of multiple benzene rings. Carcinogenic PAHs are abbreviated cPAHs.

Record of Decision (ROD): A public document that explains which alternative will be used at an NPL site and the reasons for selecting the alternative.

Remedial Investigation/Feasibility Study: Two distinct but related studies, normally conducted together prior to the proposed plan. The RI is intended to define the nature and extent of contamination at the site, whereas the FS evaluates the feasibility and costs of appropriate, site-specific remedies.

Superfund: The common name used for the Comprehensive Environmental Response, Compensation, and Liability Act, also referred to as the Trust Fund. The Superfund program was established to oversee the cleanup of hazardous waste sites.

Surficial Aquifer: Upper water bearing zone or the water table which lies just beneath the earth's surface.

TEQ: Toxicity equivalents. Commonly used to to express dioxin sample results to an equivalent value for 2,3,7,8-TCDD, considered the most toxic dioxin congener.

BRUNSWICK WOOD PRESERVING SUPERFUND SITE

USE THIS SPACE FOR COMMENTS

Your input on the Proposed Plan for the Brunswick Wood Preserving Superfun Site is important in helping EPA select appropriate cleanup actions. Throu public meetings, the Administrative Record file for the site, and announcem published in the newspaper, EPA and the State encourage the public to participate in the Superfund process. Please use the space below to write comments, then fold and mail. More comments may be included with this forn you desire.

Name: ______________________________

Address: ______________________________

____

Phone #: ______________________________

Please return this form to EPA if you would like to be added to the site mailing list. ***See page 1 for address.***

BRUNSWICK WOOD PRESERVING SUPERFUND SITE

PUBLIC COMMENT SHEET

Fold on dashed lines, staple, stamp and mail

Place Stamp

Name _______________________

Address _______________________

City _________ ***State*** __ ***Zip*** ___

Angela Leach, Community Relations Coordinator
Waste Management Division
South Site Management Branch
U. S. EPA, Region 4
61 Forsyth Street, SW

Atlanta, GA 30303

United States Environmental Protection Agency, Region 4
South Superfund Remedial Branch
61 Forsyth St., SW
Atlanta, Georgia, 30365

Official Business
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$300

Angela Leach
Community Relations

BRUNSWICK WOOD PRESERVING
NPL SUPERFUND SITE
PROPOSED PLAN FOR OU1